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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,505	10/12/2001	Mikhail Belov	E-13170	2093

7590 07/11/2003

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EXAMINER

GURZO, PAUL M

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 07/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/976,505

Applicant(s)

BELOV ET AL.

Examiner

Paul Gurzo

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5, and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz et al (5,572,022), and further in view of Kirchner et al. (5,464,975).

Regarding claim 1, Schwartz et al. teach a method for increasing the dynamic range of a mass spectrometer having at least one quadrupole filter and mass analyzer. This is accomplished by passing a sample of ions through the filter and identifying the desired and undesired ones (col. 6, lines 18 -47 and col. 11, lines 5 - 14). This filter only allows the sample ions within the desired mass to charge ratio to pass through to the mass spectrometer, and the undesired ones are ejected. They teach the use of numerous gating sequences, which teaches on the claimed introduction of more than one sample of ions (col. 6, lines 38-46). They also clearly depict the application of rf voltage to the quadrupole filter in Fig. 4, ref. 40 and 141. They continue to teach that the mass spectrometer operates to detect the ion current signal intensity corresponds to a mass spectra of the ions (col. 11, lines 55-57).

They do not explicitly state the measuring of the intensities of the mass spectrum of the first sample, but it is obvious that they can do such based on the above-stated ability to detect ion current signal intensity corresponds to a mass spectra of the ions. Further, Kirchner et al. teach that by scanning rf voltages to the quadrupole filter, a mass spectrum can be generated to show

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the signal intensity versus  $m/z$  ratio (col. 1, lines 41-54). Therefore, it would have been obvious to one having ordinary skill in the art at the time the inventions was made to measure intensities of a first sample because this will increase the efficiency of the detection and subsequent analyzing process.

Regarding claims 3, 5, and 7, Schwartz et al. teach the use of an ion trap mass spectrometer (col. 1, lines 12-16) and teaches numerous gating sequences to allow desired sample ions into the mass spectrometer (col. 6, lines 38-47). Further, it is known in the art of sample detection that numerous samples can be detected in a similar fashion, and that rf voltages can be generated by quadrupolar excitation to electrodes of an ion trap, quadrupole filter, or other suitable device as taught by Schwartz et al. (col. 1, lines 27-34).

Claims 2, 4, 6, 8, 9, 10, and 11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz et al (5,572,022) in view of Kirchner et al. (5,464,975), and further in view of Syage et al. (6,326,615).

Regarding claims 2 and 8, the above-applied prior art teaches the limitations of the claims except for the placement of an ion trap interposed between a filter and mass analyzer. However, Syage et al. teach that the use of an ion trap (418, 420) as an interface between an ionization source and mass analyzer (426, 428) has significant advantages (col. 7, lines 39-44, and Fig. 6 and 7). While they do not teach the use of a filter, this teaching can easily be extended to include such because the use of a filter for increased ion passing and measuring is known in the art as applied above and adding this filter will not deviate from the scope of the teaching of Syage et al. In addition, these figures clearly depict the claimed accumulation of ions in the ion trap and transferring of ions from the ion trap to the mass analyzer. Therefore, it would have been

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obvious to one having ordinary skill in the art at the time the inventions was made to dispose an ion trap between the filter and analyzer because this will lead to more accurate detection of desired ions.

Regarding claims 4, 6, 9, 10, and 11, Schwartz et al. teach the use of an ion trap mass spectrometer (col. 1, lines 12-16) and teaches numerous gating sequences to allow desired sample ions into the mass spectrometer (col. 6, lines 38-47). Further, it is known in the art of sample detection that numerous samples can be detected in a similar fashion, and that rf voltages can be generated by quadrupolar excitation to electrodes of an ion trap, quadrupole filter, or other suitable device as taught by Schwartz et al. (col. 1, lines 27-34).

### ***Response to Arguments***

Applicant's arguments filed May 5, 2003 have been fully considered but they are not persuasive. Applicant argues that the prior art does not teach the identification of specific ions based on the m/z ratio for ejection to allow the instrument to "focus in" on ions of interest. Applicant agrees that the Schwartz et al. reference does teach increased dynamic range, which is the purpose of the claimed invention, but argues that they accomplish this through gating - not discrimination of "desired" and "undesired" ions. However, Schwartz et al. explicitly teach that only those sample ions within the desired m/z ratio will pass through the mass filter (40) (col. 11, lines 11-14). In addition, they state throughout the specification that undesired ions are ejected.

Applicant argues that the present invention produces a dynamic range that allowed the identification of 35-40% more classes bases on trapping and accumulation times. However,

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these times are not mentioned anywhere in the claims. Therefore, the claims on the instant invention and the prior art are not differentiable.

Applicant argues that the prior art does not teach the use of a filter, but Schwartz et al. explicitly state that only those sample ions within the desired  $m/z$  ratio will pass through the mass filter (40) (col. 11, lines 11-14).

Applicant argues that the Examiner has not even addressed the limitation that “steps a-h are repeated to detect further undesired ions for ejection” in claim 11. The prior art teaches the claimed introduction of desired ions and ejection of undesired ions as taught above. Further, Schwartz et al. teach that after undesired ions are ejected, the RF voltage is lowered to readjust the  $m/z$  range of interest and that while operating the mass spectrometer the amount of ions entering the ion trap for analysis varies (col. 3, line 40 - col. 4, line 15). They also teach that the total ion current for the sample is used to gate a new and more optimum number of sample ions in the next gating sequence (col. 6, lines 42-46). These teachings render it obvious that the desired steps are repeated to achieve further ejection of the undesired ions.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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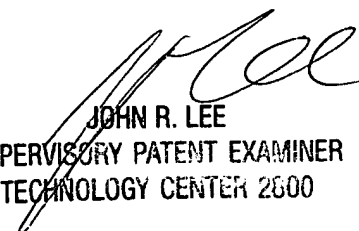
will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Gurzo whose telephone number is (703) 306-0532. The examiner can normally be reached on M-Thurs. 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on (703) 308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

PMG  
July 1, 2003

  
JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600